

## MATERIAL SAFETY DATA SHEET

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Version 1.15

## Section 1 - Product and Company Information

Product Name	METHANOL, >=99.8%, A.C.S. REAGENT
Product Number	179337
Brand	SIAL
Company	Sigma-Aldrich
Address	3050 Spruce Street SAINT LOUIS MO 63103 US
Technical Phone:	800-325-5832
Fax:	800-325-5052
Emergency Phone:	314-776-6555

## Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
METHANOL	67-56-1	Yes
Formula	CH4O	
Synonyms	Alcool methylique (French) * Alcool metilico (Italian) * Bieleski's solution * Carbinol * Colonial Spirit * Columbian Spirit * Metanolo (Italian) * Methanol (ACGIH) * Methyl alcohol (DOT:OSHA) * Methylol * Methylalkohol (German) * Methyl hydrate * Methyl hydroxide * Metylowl alcohol (Polish) * Monohydroxymethane * Pyroxylic Spirit * RCRA waste number U154 * Wood alcohol * Wood naphtha * Wood Spirit * METHYL ALCOHOL * WOOD ALCOHOL	
RTECS Number:	PC1400000	

## Section 3 - Hazards Identification

## EMERGENCY OVERVIEW

Flammable (USA) Highly Flammable (EU). Toxic.

Toxic by inhalation, in contact with skin and if swallowed. Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed. Irritating to eyes and skin.

Target organ(s): Eyes. Kidneys.

## HMIS RATING

HEALTH: 2\*

FLAMMABILITY: 3

REACTIVITY: 0

## NFPA RATING

HEALTH: 2

FLAMMABILITY: 3

REACTIVITY: 0

\*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

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## Section 4 - First Aid Measures

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### ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

### INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

### DERMAL EXPOSURE

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

### EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

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## Section 5 - Fire Fighting Measures

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### FLAMMABLE HAZARDS

Flammable Hazards: Yes

### EXPLOSION HAZARDS

Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

### FLASH POINT

52 °F 11 °C Method: closed cup

### EXPLOSION LIMITS

Lower: 6 % Upper: 36 %

### AUTOIGNITION TEMP

385 °C

### FLAMMABILITY

N/A

### EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

### FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.

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## Section 6 - Accidental Release Measures

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### PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area. Shut off all sources of ignition.

### PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

### METHODS FOR CLEANING UP

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

## ENVIRONMENTAL PRECAUTION(S)

Do not allow material to enter drains or water courses.

## Section 7 - Handling and Storage

## HANDLING

**User Exposure:** Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

## STORAGE

Suitable: Keep container closed. Keep away from heat, sparks, and open flame.

## Section 8 - Exposure Controls / PPE

## ENGINEERING CONTROLS

Safety shower and eye bath. Use nonsparking tools. Use only in a chemical fume hood.

## PERSONAL PROTECTIVE EQUIPMENT

**Respiratory:** Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Use supplied-air or SCBA respirators. Europe permits the use of type AXBEK full-face cartridge respirators (EN 14387).

Hand: Compatible chemical-resistant gloves.

Eye: Chemical safety goggles.

## GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

## EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	STEL	250 PPM
Remarks: Skin			
USA	ACGIH	TWA	200 PPM
Remarks: Skin			
USA	MSHA Standard-air	TWA	200 PPM (260 MG/M3) (SKIN)
USA	OSHA.	PEL	8H TWA 200 PPM (260 MG/M3)
New Zealand OEL			
Remarks: check ACGIH TLV			
USA	NIOSH	TWA	200 PPM (SK)
		STEL	250 PPM (SK)

## EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	100 MG/M3
Poland		NDSCh	300 MG/M3
Poland		NDSP	-

## Section 9 - Physical/Chemical Properties

Appearance	Physical State: Liquid	
	Color: Colorless	
Property	Value	At Temperature or Pressure

Molecular Weight	32.04 AMU	
pH	N/A	
BP/BP Range	64.0 - 65.0 °C	760 mmHg
MP/MP Range	- 98.0 °C	
Freezing Point	N/A	
Vapor Pressure	97.68 mmHg	20 °C
Vapor Density	0.79 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	0.791 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	100 %	
VOC Content	100 %	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	Log Kow: - 0.770	
Decomposition Temp.	N/A	
Flash Point	52 °F 11 °C	Method: closed cup
Explosion Limits	Lower: 6 %	
	Upper: 36 %	
Flammability	N/A	
Autoignition Temp	385 °C	
Refractive Index	1.329	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water: Miscible.	

N/A = not available

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## Section 10 - Stability and Reactivity

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### STABILITY

Stable: Stable.

Materials to Avoid: Acids, Acid chlorides, Acid anhydrides, Oxidizing agents, Alkali metals, Reducing agents.

### HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

### HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

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## Section 11 - Toxicological Information

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### ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.

Skin Absorption: Toxic if absorbed through skin.

Eye Contact: Causes eye irritation.

Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. Toxic if inhaled.

Ingestion: Toxic if swallowed.

### TARGET ORGAN(S) OR SYSTEM(S)

Eyes. Kidneys. Liver. Heart. Central nervous system.

### SIGNS AND SYMPTOMS OF EXPOSURE

Nausea, headache, and vomiting. Gastrointestinal disturbances.

Dizziness. Weakness. Confusion. Drowsiness. Unconsciousness. May cause convulsions. Ingestion can cause: Methyl alcohol may be

fatal or cause blindness if swallowed. Cannot be made non-poisonous.

#### TOXICITY DATA

Oral

Man

6422 mg/kg

LDLO

Remarks: Gastrointestinal:Nausea or vomiting. Lungs, Thorax, or Respiration:Dyspnea. Brain and Coverings:Changes in circulation (hemorrhage,thrombosis, etc.).

Oral

Human

428 mg/kg

LDLO

Remarks: Behavioral:Headache. Lungs, Thorax, or Respiration:Other changes.

Oral

Human

143 mg/kg

LDLO

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Optic nerve neuropathy. Lungs, Thorax, or Respiration:Dyspnea. Gastrointestinal:Nausea or vomiting.

Oral

Rat

5628 mg/kg

LD50

Inhalation

Rat

64,000 ppm

LC50

Intraperitoneal

Rat

7529 MG/KG

LD50

Intravenous

Rat

2131 MG/KG

LD50

Oral

Mouse

7300 mg/kg

LD50

Intraperitoneal

Mouse

10765 MG/KG

LD50

Subcutaneous

Mouse

9800 MG/KG

LD50

Intravenous  
Mouse  
4710 MG/KG  
LD50

Oral  
Monkey  
7000 mg/kg  
LD50  
Remarks: Behavioral:Coma. Behavioral:Ataxia. Behavioral:Muscle weakness.

Oral  
Rabbit  
14200 mg/kg  
LD50

Skin  
Rabbit  
15800 mg/kg  
LD50

Intraperitoneal  
Rabbit  
1826 MG/KG  
LD50

Intravenous  
Rabbit  
8907 MG/KG  
LD50

Intraperitoneal  
Guinea pig  
3556 MG/KG  
LD50

Intraperitoneal  
Hamster  
8555 MG/KG  
LD50

#### IRRITATION DATA

Skin  
Rabbit  
20 mg  
24H  
Remarks: Moderate irritation effect

Eyes  
Rabbit  
40 mg  
Remarks: Moderate irritation effect

Eyes  
Rabbit  
100 mg  
24H  
Remarks: Moderate irritation effect

## CHRONIC EXPOSURE - TERATOGEN

Species: Rat  
Dose: 35295 MG/KG  
Route of Application: Oral  
Exposure Time: (1-15D PREG)  
Result: Effects on Newborn: Biochemical and metabolic. Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat  
Dose: 20000 PPM/7H  
Route of Application: Inhalation  
Exposure Time: (1-22D PREG)  
Result: Specific Developmental Abnormalities: Urogenital system. Specific Developmental Abnormalities: Cardiovascular (circulatory) system. Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat  
Dose: 20000 PPM/7H  
Route of Application: Inhalation  
Exposure Time: (7-15D PREG)  
Result: Specific Developmental Abnormalities: Endocrine system. Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat  
Dose: 10000 PPM/7H  
Route of Application: Inhalation  
Exposure Time: (7-15D PREG)  
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat  
Dose: 5200 UL/KG  
Route of Application: Oral  
Exposure Time: (10D PREG)  
Result: Specific Developmental Abnormalities: Urogenital system. Specific Developmental Abnormalities: Eye, ear. Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse  
Dose: 40 GM/KG  
Route of Application: Oral  
Exposure Time: (6-15D PREG)  
Result: Specific Developmental Abnormalities: Craniofacial (including nose and tongue). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse  
Dose: 4 GM/KG  
Route of Application: Oral  
Exposure Time: (7D PREG)  
Result: Specific Developmental Abnormalities: Musculoskeletal system. Specific Developmental Abnormalities: Craniofacial (including nose and tongue).

Species: Mouse  
Dose: 1500 PPM/6H  
Route of Application: Inhalation  
Exposure Time: (7-9D PREG)

Result: Specific Developmental Abnormalities: Central nervous system.

Species: Mouse  
Dose: 5000 PPM/7H  
Route of Application: Inhalation  
Exposure Time: (6-15D PREG)  
Result: Specific Developmental Abnormalities: Craniofacial (including nose and tongue). Specific Developmental Abnormalities: Central nervous system.

Species: Mouse  
Dose: 2000 PPM/7H  
Route of Application: Inhalation  
Exposure Time: (6-15D PREG)  
Result: Specific Developmental Abnormalities: Musculoskeletal system.

#### CHRONIC EXPOSURE - MUTAGEN

Species: Human  
Dose: 300 MMOL/L  
Cell Type: lymphocyte  
Mutation test: DNA inhibition

Species: Rat  
Route: Oral  
Dose: 10 UMOL/KG  
Mutation test: DNA damage

Species: Mouse  
Dose: 7900 MG/L (+S9)  
Cell Type: lymphocyte  
Mutation test: Mutation in microorganisms

Species: Mouse  
Route: Oral  
Dose: 1 GM/KG  
Mutation test: Cytogenetic analysis

Species: Mouse  
Route: Intraperitoneal  
Dose: 75 MG/KG  
Mutation test: Cytogenetic analysis

#### CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat  
Dose: 7500 MG/KG  
Route of Application: Oral  
Exposure Time: (17-19D PREG)  
Result: Effects on Newborn: Behavioral.

Species: Rat  
Dose: 35295 MG/KG  
Route of Application: Oral  
Exposure Time: (1-15D PREG)  
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Fertility: Female



fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated ).

Species: Rat

Dose: 20 GM/KG

Route of Application: Oral

Exposure Time: (6-15D PREG)

Result: Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth). Effects on Fertility:

Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat

Dose: 200 PPM/20H

Route of Application: Oral

Exposure Time: (78W MALE)

Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Mouse

Dose: 7500 PPM/7H

Route of Application: Inhalation

Exposure Time: (6-15D PREG)

Result: Effects on Embryo or Fetus: Fetal death. Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mouse

Dose: 15000 PPM

Route of Application: Inhalation

Exposure Time: (7-9D PREG)

Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mouse

Dose: 5 GM/KG

Route of Application: Intraperitoneal

Exposure Time: (5D MALE)

Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).

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## Section 12 - Ecological Information

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### ACUTE ECOTOXICITY TESTS

Test Type: LC50 Fish

Species: *Onchorhynchus mykiss* (Rainbow trout)

Time: 96 h

Value: 19,000 mg/l

Test Type: LC50 Fish

Species: *Cyprinus carpio*

Time: 48 h

Value: 36,000 mg/l

Test Type: EC50 Daphnia

Species: *Daphnia magna*

Time: 48 h

Value: 24,500 mg/l

Test Type: EC100 Daphnia

Species: Daphnia magna  
Time: 24 h  
Value: 10,000 mg/l

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## Section 13 - Disposal Considerations

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### APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

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## Section 14 - Transport Information

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### DOT

Proper Shipping Name: Methanol  
UN#: 1230  
Class: 3  
Packing Group: Packing Group II  
Hazard Label: Flammable liquid  
PIH: Not PIH

### IATA

Proper Shipping Name: Methanol  
IATA UN Number: 1230  
Hazard Class: 3  
Packing Group: II

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## Section 15 - Regulatory Information

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### EU DIRECTIVES CLASSIFICATION

Symbol of Danger: F-T  
Indication of Danger: Highly Flammable. Toxic.  
R: 11-23/24/25-39/23/24/25  
Risk Statements: Highly flammable. Toxic by inhalation, in contact with skin and if swallowed. Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.  
S: 7-16-36/37-45  
Safety Statements: Keep container tightly closed. Keep away from sources of ignition - no smoking. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

### US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Flammable (USA) Highly Flammable (EU). Toxic.  
Risk Statements: Toxic by inhalation, in contact with skin and if swallowed. Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed. Irritating to eyes and skin.  
Safety Statements: Keep container tightly closed. Keep away from sources of ignition - no smoking. Take precautionary measures against static discharges. Avoid contact with skin. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).  
US Statements: Target organ(s): Eyes. Kidneys.

### UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes

DEMINIMIS: 1 %

NOTES: This product is subject to SARA section 313 reporting requirements.

TSCA INVENTORY ITEM: Yes

#### CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: Yes

NDSL: No

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#### Section 16 - Other Information

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#### DISCLAIMER

For R&D use only. Not for drug, household or other uses.

#### WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2006 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.